#14

1600

RAW SEQUENCE LISTING   DATE: 05/07/2003
PATENT APPLICATION: **US/09/900,237A**   TIME: 13:58:19

Input Set : A:\BB-1170USCIP~1.txt
Output Set: N:\CRF4\05072003\I900237A.raw

p.6

ENTERED

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 3 <110> APPLICANT: Allen, Stephen M.
 5 <120> TITLE OF INVENTION: Plant Cellulose Synthases
 7 <130> FILE REFERENCE: BB1170 US CIP
 9 <140> CURRENT APPLICATION NUMBER: US 09/900,237A
10 <141> CURRENT FILING DATE: 2001-07-06
12 <150> PRIOR APPLICATION NUMBER: US 60/092,844
13 <151> PRIOR FILING DATE: 1998-07-14
15 <150> PRIOR APPLICATION NUMBER: PCT/US99/15871
16 <151> PRIOR FILING DATE: 1999-07-13
18 <150> PRIOR APPLICATION NUMBER: 09/720383
19 <151> PRIOR FILING DATE: 2000-12-21
21 <160> NUMBER OF SEQ ID NOS: 33
23 <170> SOFTWARE: Microsoft Office 97
25 <210> SEQ ID NO: 1
26 <211> LENGTH: 1221
27 <212> TYPE: DNA
28 <213> ORGANISM: Hordeum vulgare
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32 catgccacca cgaccttgtt tcaagggttc tgcgccaatc aatctctctg accgtctcaa  120
33 tcaagttctc cggtgggctc ttgggtcagt tgaaattctg tttagcagac attgtcctat  180
34 ctggtacaat tacggtgggc ggttgaaact tctggagagg atggcttaca tcaacaccat  240
35 tgtttatcca ataacatccc ttccacttat cgcctattgt gtgcttcctg ctatctgtct  300
36 cctcaccaac aaatttatca ttcccgagat cagtaactat gctgggatgt cttttattct  360
37 tatgtttgcc tccatctttg ccacgggtat attggagctg cgatggagtg gtgtcggcat  420
38 cgaggactgg tggagaaacg agcagttctg ggttattggt ggcacatctg cccatctttt  480
39 cgcagtgttc cagggtctgc tgaaggtgtt ggccgggatt gacaccaact tcacggttac  540
40 ctcgaaggca aacgacgagg atggcgattt tgctgagtta tacgtgttca agtggaccag  600
41 tctcctcatt cctccgacca ccgtccttgt gattaacctg gtgggcatgg tggcaggcat  660
42 atcatatgcc atcaacagcg gttaccagtc ttggggtcca ctcttcggaa agctcttctt  720
43 ctcaatctgg gtgatcctcc atctctaccc cttcctcaag ggtctcatgg ggaagcagaa  780
44 ccgcacgcca accatcgtca ttgtttggtc catcctccta gcctccatct tctccctcct  840
45 gtgggtgaag atcgaccctt tcatatccga tacccagaaa gccgtcgcca tggggcagtg  900
46 tggcgtcaac tgctgatcgg cgccgaagag tatctgcccc cctcgtgtaa ataccggagg  960
47 gggttggatg ggattttgtt gttgtagatg aagacggagt tttatgtaag ttattattgc 1020
48 cccttcgtgc tgagaagcac aaaccgtgaa gcctacgaaa cctgcagcgt acattgtgat 1080
49 ttttttctcc ttttctttc atctgtgata cctgttgttt cttcttagag tatattatgt 1140
50 cagaacgtat ctatagttct atacacacta tgacaccaac tatttatata aggcagctgt 1200
51 tgcatcaact cttctgcaaa a                                            1221
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54 <211> LENGTH: 304
55 <212> TYPE: PRT
56 <213> ORGANISM: Hordeum vulgare
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Input Set : **A:\BB-1170USCIP~1.txt**
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59 His Glu Asp Ile Leu Thr Gly Phe Lys Met His Ala Arg Gly Trp Ile
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62 Ser Ile Tyr Cys Met Pro Pro Arg Pro Cys Phe Lys Gly Ser Ala Pro
63              20                  25                 30
65 Ile Asn Leu Ser Asp Arg Leu Asn Gln Val Leu Arg Trp Ala Leu Gly
66           35                  40                 45
68 Ser Val Glu Ile Leu Phe Ser Arg His Cys Pro Ile Trp Tyr Asn Tyr
69        50                  55                 60
71 Gly Gly Arg Leu Lys Leu Leu Glu Arg Met Ala Tyr Ile Asn Thr Ile
72 65                  70                  75                 80
74 Val Tyr Pro Ile Thr Ser Leu Pro Leu Ile Ala Tyr Cys Val Leu Pro
75              85                  90                 95
77 Ala Ile Cys Leu Leu Thr Asn Lys Phe Ile Ile Pro Glu Ile Ser Asn
78           100                 105                110
80 Tyr Ala Gly Met Phe Phe Ile Leu Met Phe Ala Ser Ile Phe Ala Thr
81        115                 120                125
83 Gly Ile Leu Glu Leu Arg Trp Ser Gly Val Gly Ile Glu Asp Trp Trp
84     130                 135                140
86 Arg Asn Glu Gln Phe Trp Val Ile Gly Gly Thr Ser Ala His Leu Phe
87 145                 150                 155                160
89 Ala Val Phe Gln Gly Leu Leu Lys Val Leu Ala Gly Ile Asp Thr Asn
90                 165                 170                175
92 Phe Thr Val Thr Ser Lys Ala Asn Asp Glu Asp Gly Asp Phe Ala Glu
93              180                 185                190
95 Leu Tyr Val Phe Lys Trp Thr Ser Leu Leu Ile Pro Pro Thr Thr Val
96           195                 200                205
98 Leu Val Ile Asn Leu Val Gly Met Val Ala Gly Ile Ser Tyr Ala Ile
99     210                 215                220
101 Asn Ser Gly Tyr Gln Ser Trp Gly Pro Leu Phe Gly Lys Leu Phe Phe
102 225                 230                 235                240
104 Ser Ile Trp Val Ile Leu His Leu Tyr Pro Phe Leu Lys Gly Leu Met
105              245                 250                255
107 Gly Lys Gln Asn Arg Thr Pro Thr Ile Val Ile Val Trp Ser Ile Leu
108           260                 265                270
110 Leu Ala Ser Ile Phe Ser Leu Leu Trp Val Lys Ile Asp Pro Phe Ile
111        275                 280                285
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114     290                 295                300
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117 <211> LENGTH: 3776
118 <212> TYPE: DNA
119 <213> ORGANISM: Zea mays
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124 ccgccgccgc cgcacgcacg cttgccccgg gatctggaga tctggtagcg ccagggggat   180
125 ggaggccagc gccgggctgg tcgccggctc gcacaaccgg aacgagctcg tcgtcatccg   240
126 ccgcgatggc gagccagggc cgaagcccat ggaccagcgg aacggccagg tgtgccagat   300
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RAW SEQUENCE LISTING   DATE: 05/07/2003
PATENT APPLICATION: **US/09/900,237A**   TIME: 13:58:19

Input Set : **A:\BB-1170USCIP~1.txt**
Output Set: **N:\CRF4\05072003\I900237A.raw**

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127 ttgcggcgac gacgtggggc gcaaccccga cggggagccg ttcgtggcct gcaacgagtg  360
128 cgccttcccc atctgccggg actgctacga gtacgagcgc cgcgagggca cgcagaactg  420
129 cccccagtgc aagacccgct tcaagcgcct caaggggtgc gcgcgcgtgc ccggggacga  480
130 ggaggaggac ggcgtcgacg acctggagaa cgagttcaac tggagcgaca agcacgactc  540
131 ccagtacctc gccgagtcca tgctccacgc ccacatgagc tacggccgcg gcgccgacct  600
132 cgacggcgtg ccgcagccat tccaccccat ccccaatgtt cccctcctca ccaacggaca  660
133 gatggtcgat gacatcccgc cggaccagca cgcccttgtg ccctcgttcg tgggtggcgg  720
134 ggggaagagg attcaccctc tcccgtacgc ggatcccaac cttcctgtgc aaccgaggtc  780
135 tatggaccct tccaaggatc tcgccgcata tggctacggg agcgtagcat ggaaggagag  840
136 gatggagagc tggaagcaga agcaggagag gatgcaccag acgaggaacg atggcggcgg  900
137 cgatgatggt gatgatgcag atctaccact aatggatgaa gctagacagc cattgtccag  960
138 aaagatcccg cttccttcaa gccaaatcaa cccctatagg atgattataa taattcggct 1020
139 agtggttttg tgtttcttct tccactaccg agtgatgcat ccggtgcctg atgcatttgc 1080
140 tttatggctc atatctgtga tctgtgaaat ttggtttgcc atgtcttgga ttcttgacca 1140
141 gtttccaaag tggtttccta tcgagaggga aacctatctt gaccggctga gtttaaggtt 1200
142 tgacaaggaa gggcatcctt ctcaactcgc ccctgttgat ttctttgtca gtacggttga 1260
143 tcccttgaag gaacctccat tggtcactgc taatactgtt ctatctatcc tttcggtgga 1320
144 ttatccagtt gataaggttt catgctacgt ttctgatgat ggtgctgcca tgctgacatt 1380
145 tgaagcattg tctgaaacat ctgaatttgc aaagaaatgg gttcctttct gcaaaagata 1440
146 tagccttgag cctcgtgctc cagagtggta cttccaacag aagatagact acctgaaaga 1500
147 caaggtggcg ccaaactttg ttagagaacg gagagcaatg aagagagagt atgaggaatt 1560
148 caaggtcaga atcaatgcct tggttgctaa agcccaaaag gttcctgagg aaggatggac 1620
149 aatgcaggat ggaactccat ggcccggaaa taatgtccgt gatcatcctg gaatgattca 1680
150 ggtttttctt ggtcaaagtg gtggccatga tgtggaagga aatgagctgc ctcgattggt 1740
151 ttatgtttca agagaaaaac ggccaggcta caaccatcac aagaaggctg gtgctatgaa 1800
152 tgcattggtc cgagtctctg ctgtactaac taatgctcct tatttgctga acttggattg 1860
153 tgatcactat atcaataata gtaaggctat aaaggaagca atgtgtttta tgatggatcc 1920
154 tttgcttgga aagaaagttt gctatgtgca gtttcctcaa agatttgatg ggattgatcg 1980
155 ccatgatcga tatgctaaca gaaatgttgt cttttcgat atcaacatga aggtttgga 2040
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159 taaacctaaa tttgagaaga taaagaaact tttaagaaa aggaaaatc aagcccctgc 2280
160 atatgctctt ggtgaaattg atgaagccgc tccaggagct gaaaatgaaa aggctagtat 2340
161 tgtaaatcaa cagaagttgg aaaagaaatt tggccagtct tcagtttttg ttgcatccac 2400
162 acttcttgag aatggtggaa ccctgaagag tgccagtcca gcttctcttc tgaaggaagc 2460
163 tatacatgtc atcagttgtg gatatgaaga caaaacaggc tggggaaaag atattggttg 2520
164 gatttatgga tcagtcacag aagatattct tactgggttt aagatgcact gccatggttg 2580
165 gcggtcaatt tactgcatac ctaaacgggc cgccttcaaa ggttccgcac ctctcaatct 2640
166 ttccgatcgt cttcaccagg ttcttcggtg ggctcttggt tcaattgaaa ttttcttcag 2700
167 caaccactgc cctctctggt atgggtatgg tggtggacta agttcctgg aaaggttttc 2760
168 gtacattaac tccatcgtat acccttggac atctatcccg ctcttggcct attgcacatt 2820
169 gcctgccatc tgcttgctga cagggaaatt tatcacgcca gagcttaaca atgttgccag 2880
170 cctctggttc atgtcacttt tcatctgcat ttttgctacg agcatcctgg aaatgagatg 2940
171 gagtggtgta ggcatcgatg actggtggag aaacgagcag ttttgggtca ttggaggcgt 3000
172 gtcttcacat ctctttgctg tgttccaggg actcctcaag gtcatagctg gtgtagacac 3060
173 gagcttcact gtgacatcca agggcggaga cgacgaggag ttctcagagc tgtacacatt 3120
174 caaatggacg acccttctga tacctccgac aaccctgctc ctactgaact tcattggagt 3180
175 ggtagctggc atctccaatg cgatcaacaa cggatatgaa tcatggggcc ccctgttcgg 3240
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RAW SEQUENCE LISTING   DATE: 05/07/2003
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Input Set : **A:\BB-1170USCIP~1.txt**
Output Set: **N:\CRF4\05072003\I900237A.raw**

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178 cttctcgctg ctttgggtcc ggatcgaccc gttccttgcg aaggatgatg gtcccctgtt 3420
179 ggaggagtgt ggtctggatt gcaactagga ggtcagcacg tggacttccc cgtcagtgtg 3480
180 tggtcgaaga agtatttttg cagatgtttt gtgcccatat ttctttttttc aattttttgtc 3540
181 cctctgtaga tagaaacaag gggagaaggg gaaaaaaagt acttgtattt cttttgttcc 3600
182 atggtggtgg tggtggtggg cggctcagcc tcgtgagtgc agtattgggc aaaccggagg 3660
183 ctgcggcaac cttgtgcagt tcggccacga atatactagg gaagatcgcg accaatcaat 3720
184 caatcgatga ccgagttcaa ttgttcagca aaaaaaaaaa aaaaaaaaaa aaaaa       3776
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187 <211> LENGTH: 1148
188 <212> TYPE: PRT
189 <213> ORGANISM: Zea mays
191 <400> SEQUENCE: 4
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195 Gln Lys Leu Ala Ser Val Ser Leu Pro Leu Pro His Ser Arg Phe Ile
196              20                  25                  30
198 Pro Phe Pro Pro Arg Arg Arg Tyr Arg Arg Arg Arg Thr His Ala Cys
199          35                  40                  45
201 Pro Gly Ile Trp Arg Ser Gly Ser Ala Arg Gly Met Glu Ala Ser Ala
202      50                  55                  60
204 Gly Leu Val Ala Gly Ser His Asn Arg Asn Glu Leu Val Val Ile Arg
205 65                  70                  75                  80
207 Arg Asp Gly Glu Pro Gly Pro Lys Pro Met Asp Gln Arg Asn Gly Gln
208              85                  90                  95
210 Val Cys Gln Ile Cys Gly Asp Asp Val Gly Arg Asn Pro Asp Gly Glu
211             100                 105                 110
213 Pro Phe Val Ala Cys Asn Glu Cys Ala Phe Pro Ile Cys Arg Asp Cys
214         115                 120                 125
216 Tyr Glu Tyr Glu Arg Arg Glu Gly Thr Gln Asn Cys Pro Gln Cys Lys
217     130                 135                 140
219 Thr Arg Phe Lys Arg Leu Lys Gly Cys Ala Arg Val Pro Gly Asp Glu
220 145                 150                 155                 160
222 Glu Glu Asp Gly Val Asp Asp Leu Glu Asn Glu Phe Asn Trp Ser Asp
223             165                 170                 175
225 Lys His Asp Ser Gln Tyr Leu Ala Glu Ser Met Leu His Ala His Met
226         180                 185                 190
228 Ser Tyr Gly Arg Gly Ala Asp Leu Asp Gly Val Pro Gln Pro Phe His
229         195                 200                 205
231 Pro Ile Pro Asn Val Pro Leu Leu Thr Asn Gly Gln Met Val Asp Asp
232     210                 215                 220
234 Ile Pro Pro Asp Gln His Ala Leu Val Pro Ser Phe Val Gly Gly Gly
235 225                 230                 235                 240
237 Gly Lys Arg Ile His Pro Leu Pro Tyr Ala Asp Pro Asn Leu Pro Val
238         245                 250                 255
240 Gln Pro Arg Ser Met Asp Pro Ser Lys Asp Leu Ala Ala Tyr Gly Tyr
241         260                 265                 270
243 Gly Ser Val Ala Trp Lys Glu Arg Met Glu Ser Trp Lys Gln Lys Gln
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RAW SEQUENCE LISTING
PATENT APPLICATION: **US/09/900,237A**

DATE: 05/07/2003
TIME: 13:58:19

Input Set : **A:\BB-1170USCIP~1.txt**
Output Set: **N:\CRF4\05072003\I900237A.raw**

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244         275                    280                    285
246 Glu Arg Met His Gln Thr Arg Asn Asp Gly Gly Gly Asp Asp Gly Asp
247     290                    295                    300
249 Asp Ala Asp Leu Pro Leu Met Asp Glu Ala Arg Gln Pro Leu Ser Arg
250 305                    310                    315                    320
252 Lys Ile Pro Leu Pro Ser Ser Gln Ile Asn Pro Tyr Arg Met Ile Ile
253                    325                    330                    335
255 Ile Ile Arg Leu Val Val Leu Cys Phe Phe Phe His Tyr Arg Val Met
256                    340                    345                    350
258 His Pro Val Pro Asp Ala Phe Ala Leu Trp Leu Ile Ser Val Ile Cys
259                    355                    360                    365
261 Glu Ile Trp Phe Ala Met Ser Trp Ile Leu Asp Gln Phe Pro Lys Trp
262     370                    375                    380
264 Phe Pro Ile Glu Arg Glu Thr Tyr Leu Asp Arg Leu Ser Leu Arg Phe
265 385                    390                    395                    400
267 Asp Lys Glu Gly His Pro Ser Gln Leu Ala Pro Val Asp Phe Phe Val
268                    405                    410                    415
270 Ser Thr Val Asp Pro Leu Lys Glu Pro Pro Leu Val Thr Ala Asn Thr
271                    420                    425                    430
273 Val Leu Ser Ile Leu Ser Val Asp Tyr Pro Val Asp Lys Val Ser Cys
274                    435                    440                    445
276 Tyr Val Ser Asp Asp Gly Ala Ala Met Leu Thr Phe Glu Ala Leu Ser
277     450                    455                    460
279 Glu Thr Ser Glu Phe Ala Lys Lys Trp Val Pro Phe Cys Lys Arg Tyr
280 465                    470                    475                    480
282 Ser Leu Glu Pro Arg Ala Pro Glu Trp Tyr Phe Gln Gln Lys Ile Asp
283                    485                    490                    495
285 Tyr Leu Lys Asp Lys Val Ala Pro Asn Phe Val Arg Glu Arg Arg Ala
286                    500                    505                    510
288 Met Lys Arg Glu Tyr Glu Glu Phe Lys Val Arg Ile Asn Ala Leu Val
289     515                    520                    525
291 Ala Lys Ala Gln Lys Val Pro Glu Glu Gly Trp Thr Met Gln Asp Gly
292     530                    535                    540
294 Thr Pro Trp Pro Gly Asn Asn Val Arg Asp His Pro Gly Met Ile Gln
295 545                    550                    555                    560
297 Val Phe Leu Gly Gln Ser Gly Gly His Asp Val Glu Gly Asn Glu Leu
298                    565                    570                    575
300 Pro Arg Leu Val Tyr Val Ser Arg Glu Lys Arg Pro Gly Tyr Asn His
301                    580                    585                    590
303 His Lys Lys Ala Gly Ala Met Asn Ala Leu Val Arg Val Ser Ala Val
304     595                    600                    605
306 Leu Thr Asn Ala Pro Tyr Leu Leu Asn Leu Asp Cys Asp His Tyr Ile
307     610                    615                    620
309 Asn Asn Ser Lys Ala Ile Lys Glu Ala Met Cys Phe Met Met Asp Pro
310 625                    630                    635                    640
312 Leu Leu Gly Lys Lys Val Cys Tyr Val Gln Phe Pro Gln Arg Phe Asp
313                    645                    650                    655
315 Gly Ile Asp Arg His Asp Arg Tyr Ala Asn Arg Asn Val Val Phe Phe
316                    660                    665                    670
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 05/07/2003
PATENT APPLICATION: **US/09/900,237A**   TIME: 13:58:20

Input Set : **A:\BB-1170USCIP~1.txt**
Output Set: **N:\CRF4\05072003\I900237A.raw**

<u>Please Note:</u>
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:14; Xaa Pos. 201
Seq#:19; N Pos. 262
Seq#:20; Xaa Pos. 88